WHAT IS CLAIMED IS:

1. A bandwidth control device for a network switch having a plurality of client ports and at least one uplink port to switch packets among the client ports and the uplink port, each client port having a predefined bandwidth threshold, the bandwidth control device comprising:

a first multiplier for multiplying a traffic rate TrΔ[n] of a client port in a time slot n by a first multiplicator g (g<1), where the time slot n is defined as a time interval from time t_n to t_{n+1}, and the traffic rate represents length of transmitted packets;

a second multiplier for multiplying an average traffic rate Tr[n] of the client port actually generated before time slot n and stored in the register 34 by a second multiplicator 1-g;

an adder for adding outputs from the first multiplier and the second multiplier, so as to obtain an average traffic rate of the client port before time slot n+1 as $Tr[n+1] = g*Tr\Delta[n] + (1-g)*Tr[n]$;

the register provided for temporarily storing the average traffic rate Tr[n+1] of the client port generated before time slot n+1; and

a comparator for comparing the average traffic rate Tr[n+1] of the client port generated before time slot n+1 and a bandwidth threshold Tr_pre of the client port, and if Tr[n+1] is smaller than Tr_pre, the client port being allowed to transmit packets.

2. The bandwidth control device as claim in claim 1, wherein the register is a flip-flop.

3. The bandwidth control device as claim in claim 1, wherein, after being compared by the comparator, if Tr[n+1] is larger than

Tr_pre, the packet uncapable of being transmitted is stored in a packet memory of the network switch.

4. The bandwidth control device as claim in claim 1, wherein the client's port is connected to a 10Base-T or a 100Base-T Ethernet.

5. The bandwidth control device as claim in claim 1, wherein the uplink port is connected to a 100Base-T or a 1000Base-T Ethernet.

6. A bandwidth control method for a network switch having a plurality of client ports and at least one uplink port to switch packets among the client ports and the uplink port, each client port having a predefined bandwidth threshold, the method comprising the steps of:

(A) initializing a traffic rate $Tr\Delta[n]$ of a client port in time time slot n to 0, where the time slot n is defined as a time interval from time t_n to t_{n+1}, and the traffic rate represents length of transmitted packets;

(B) determining whether there is a packet to be transmitted, and if yes, calculating an average traffic rate of the client port generated before time slot n+1 as $Tr[n+1]=g*Tr\Delta[n] + (1-g)*Tr[n]$, where $g<1$ and $Tr[n]$ is an average traffic rate actually generated before time slot n;

(C) determining whether the average traffic rate $Tr[n+1]$ of the client port generated before time slot n+1 is larger than a bandwidth threshold Tr_pre of the client port, and if no, transmitting the packet; and

(D) updating the traffic rate $Tr\Delta[n]$ in time slot n as $Tr\Delta[n] = Tr\Delta[n]+$ packet length, updating the average traffic rate $Tr[n+1]$ generated before time slot n+1 as $Tr[n+1] = g*Tr\Delta[n] + (1-$

g)*Tr[n], determining whether to enter into a next time slot, and if no, executing step (B).

16. The bandwidth control method as claim in claim 6, wherein in step (D), when entering into the next time slot, there are performed n=n+1 and Tr[n]=g*TrΔ[n-1]+(1-g)*Tr[n-1], and then step (A) is executed.

17. The bandwidth control method as claim in claim 6, wherein in step (B), if there is no packet to be transmitted, it is determined whether to enter into a next time slot, and if no, step (B) is executed.

18. The bandwidth control method as claim in claim 7, wherein, when entering into the next time slot, there are performed n=n+1 and Tr[n]=g*TrΔ[n-1]+(1-g)*Tr[n-1], and then step (A) is executed.

19. The bandwidth control method as claim in claim 1, wherein in step (C), if the average traffic rate Tr[n+1] generated before time slot n+1 is larger than a bandwidth threshold Tr_pre of the client port, it is determined whether to enter into a next time slot, and if no, it waits for the next time slot.

20. The bandwidth control method as claim in claim 9, wherein, when entering into the next time slot, there are performed n=n+1 and Tr[n]=g*TrΔ[n-1]+(1-g)*Tr[n-1], and then step (A) is executed.